SECTION C

EXISTING AND PLANNED SYSTEMS

Existing Traffic Signals and Systems

Alabama Department of Transportation Closed-Loop System Projects - Ten corridors in Jefferson County are programmed for traffic signal improvements including equipment upgrades and the installation of a closed-loop system. The following improvements will be carried out at each future system except where stated otherwise:

. System detector loops will be installed to monitor traffic conditions and enable the closed-loop system to operate in the traffic responsive mode.

. New communications cable will be installed linking the intersections together in each system. Existing interconnect cable will be abandoned or removed.

. New controller cabinets and state-of-the-art NEMA controllers will be installed at each intersection.

. Existing traffic loops will be replaced and new loops will be installed as needed so that each intersection will be fully actuated.

. Optimized traffic signal timing plans including coordination settings will be developed.

The future U.S. 3 1 systems in Fultondale and Gardendale will be upgraded to an interconnected Time of Day (TOD) system. The above improvements will be carried out for these two U.S. 3 1 systems except for system detector installation.

The existing signal equipment and the degree to which the existing signals are coordinated vary throughout the future systems. In general, the existing signal timings are at least several years old. The existing conditions and proposed improvements specific to each future system are discussed below:

1. U.S. 78 West - U.S. 78 West is a four-lane divided roadway with intersection turn lanes. The future closed-loop system here will include seven signalized intersections. The U.S. 78 West system will be controlled from the central computer located in the Alabama DOT Traffic Control Room.

The existing U.S. 78 West traffic signal controllers generally are of the Transit 1880 or similar type. There are no existing interconnect or communications linking the U.S. 78 West signals. Some coordination of the signals exists by means of Time Base Coordination VW*

2. Alabama 75 - Three intersections will be added to an existing Alabama DOT closed-loop system on AL 75 south of Center Point. Currently, two of the three intersections to be added are unsignalized. The closed-loop system project will include traffic signal installation at these two intersections, plus new cabinet, controller, and loop installations for AL 75 at 16th Avenue which is already signalized.
3. Alabama 79 - AL 79 is a four-lane divided roadway with intersection turn lanes. The future closed-loop system here will include 12 intersections. As part of the closed-loops system projects, new traffic signals will be installed at four of the intersections which currently are unsignalized. The AL, 79 system will be controlled from the central computer located in the Alabama DOT traffic control room.

   There are no interconnect or communications linking the existing AL 79 signals. Some coordination of these signals exists by means of TBC.
4. U.S. 31 (Vestavia) - Twelve intersections on U.S. 31 in Vestavia will be brought under closed-loop control in two sub-systems as part of the closed-loop system project. The first sub-system will consist of five intersections starting at Old Creek Trail and ending at Shades Crest Road. The second sub-system with seven intersections will start at Columbiana Road and end at the Foodworld Shopping Center intersection. The U.S. 31 Vestavia closed-loop system will be controlled from a central computer and traffic control room to be installed at Vestavia as part of the closed-loop system project.

   Some of the U.S. 31 Vestavia signals are coordinated by means of TBC. Also, there is some TOD coordination using existing interconnect cable. The existing cable is not communications grade.
5. U.S. 11 (Bessemer) - The Bessemer U.S. 11 future closed-loop system will include seven intersections. U.S. 11 here is a five-lane road with a continuous two-way left turn lane.

The street pattern is a grid network with side street intersections approximately every 700 feet. The U.S. 3 1 closed-loop system along AL 150 in Bessemer will be controlled from a central computer and traffic control room to be installed at Bessemer as part of the project. Some coordination of the U.S. 11 signals exists today by means of a hard-wire interconnected, pre-timed system.

6. Alabama 150 (Bessemer) - The AL 150 future closed-loop system in Bessemer will include six intersections. AL, 150 here is a five-lane road with a continuous two-way left turn lane. The street pattern is a grid network with side street intersections approximately every 700 feet. The AL 150 closed-loop system and the other future closed-loop system along U.S. 11 in Bessemer will be controlled from a central computer and traffic control room to be installed at Bessemer as part of the project. Some coordination of the U.S. 11 signals exists today by means of a hard-wire interconnected, pre-timed system.
7. U.S. 11 (Midfield) - U.S. 11 in Midfield is a four-lane divided arterial. Five signalized intersections along U.S. 11 that are running as fully actuated, isolated intersections will be brought under closed-loop control. There is no existing interconnect or communications linking the intersections together. The Midfield U.S. 11 closed-loop system will be controlled from a central computer and traffic control room to be installed at Midfield as part of the closed-loop system project.
8. U.S. 78 (Irondale) - U.S. 78 in Irondale is a six-lane divided arterial. Five signalized intersections along U.S. 78 currently running as isolated intersections will be brought under closed-loop control. There is no existing interconnect or communications linking the intersections together. The U.S. 78 Irondale closed-loop system will be controlled from a central computer and traffic control room to be installed at Irondale as part of the closed-loop system project.

Communications cable will be installed to link the five intersections together. System detector loops will be installed to monitor traffic conditions and enable the closed-loop system to operate in the traffic responsive mode. New controller cabinets and state-of-the-art NEMA controllers will be installed at each intersection. Existing traffic loops will be replaced and new loops will be installed as needed so that each intersection will be fully

actuated. Additionally, optimized traffic signal timing plans will be developed for the Midfield U.S. 78 traffic signals.

9. U.S. 3 1 (Fultondale) - U.S. 3 1 in Fultondale is a four-lane divided arterial. The U.S. 3 1 intersections at Central Avenue, New Castle Road, and Republic Avenue form an existing TBC system. The existing traffic signal controllers here generally are of the Transit 1880 or similar type. There is no existing interconnection or communications linking the three signals.

   As part of the closed-loop system project, the U.S. 31 Fultondale intersections will be upgraded to an interconnected TOD system. Communications grade cable will be installed to link the intersections together.

10. U.S. 31 (Gardendale) - U.S. 31 in Gardendale is a four-lane divided arterial. Five U.S. 31 signalized intersections starting at Tarrant Road and ending at Moncrief Road form an existing TBC system. The existing traffic signal controllers here generally are of the Transit 1880 ‘or similar type. There is no existing interconnect or communications linking the five intersections together.

    As part of the closed-loop system, project, the U.S. 31 Gardendale intersections will be upgraded to an interconnected TOD system. Communications grade cable will be installed to link the intersections together.

City of Birmingham Closed-Loop System Projects - Nine corridors in the City of Birmingham are programmed for traffic signal improvements including equipment upgrades and the installation of a closed-loop system. The following improvements will be carried out at each future system:

- New communications cable will be installed linking the intersections together in each system. Existing interconnect cable will be abandoned or removed.
- New controller cabinets and state-of-the-art Type 170 controllers will be installed at each intersection.

For all of the systems together, one or more central computers will be installed at the Birmingham traffic control center to monitor the local intersections, select timing patterns, and make it possible for the systems to operate in the traffic responsive mode.

The existing signal equipment and the degree to which the existing signals are coordinated vary throughout the future systems. In general, the existing signal timings are at least several years old. The existing conditions and proposed improvements specific to each future system are described below.

1. Eastwood Mall Expanded System - Thirteen signalized intersections will be added to the existing Eastwood Mall closed-loop system. The new on-system intersections will bring heavily traveled segments of such arterials as Crestwood Boulevard, Montclair Road and 41st Street under closed-loop, coordinated signal control.
2. The existing traffic signal controllers at the future on-system intersections generally are of the Transit 1880 type with some fixed-time electro-mechanical controllers as well. Approximately one-half of the future on-system intersections are coordinated using existing hardwire interconnect table. The rest of the intersections to be added currently operate as isolated intersections.
3. Lomb Avenue - The Lomb Avenue future system will include the McMillon Avenue, Cotton Avenue, Tuscaloosa Avenue, and 7th Street existing signalized intersections in the area just southwest of the CBD.
4. The existing traffic signal controllers here are Transit 188OE's and the intersections are coordinated by means of TBC. There are no existing interconnect or communications linking the U.S. 78 West signals.
5. 20th Street - The future 20th Street system will include ten signalized intersections starting at the I-59 eastbound and westbound ramps and ending at Avenue C. 20th Street is a six-lane divided arterial in this segment which lies west of the CBD area.

6. The existing 20th Street traffic signal controllers generally are of the fixed-time electro-mechanical type. Approximately one-half of the future closed-loop system intersections are coordinated today using hardwire interconnect cable. The remainder of the future system intersections currently operate as isolated semi-actuated intersection.
7. U.S. 78/Arkadelphia Road - U.S. 78/Arkadelphia Road is a major north/south artery that connects the downtown area and 1-20/I-59 with Birmingham's northwestern suburbs. Eleven intersections on U.S. 78iArkadelphia Road will be brought together in a closed-loop system.
8. The U.S. 78/Arkadelphia Road existing traffic signal controllers are generally of the Transit 1880E or older type. Two groups consisting of two intersections and three intersections, respectively, operate on TBC.
9. 26th Street - 26th Street is a four-lane divided arterial. The future closed-loop system here will include 11 signalized intersections. All except two of the future system intersections are coordinated today by means of existing hardwire interconnect. Most of these intersections have electro-mechanical controllers.
10. Airport Highway - Six intersections along Airport Highway will be brought under closed-loop system control. Four of the six future system intersections are coordinated today by means of existing hardwire interconnect. The remaining two intersections operate today as isolated intersections.
11. 6th Avenue - The 6th Avenue future system will include seven signalized intersections starting at 8th Street and ending at MLK Jr. Drive. Six intersections, from 6th Street to MLK Jr. Drive, are coordinated by means of existing time based coordination with Transit 1880E or older type controllers. The remaining intersection at 8th Street has an existing Type I70 controller and operates today as an isolated intersection. There is no existing interconnect or communications linking the 6th Avenue signals.
12. Green Springs Avenue - The future Green Springs Avenue system will include five existing signalized intersections Tom MLK Jr. Drive to the I-65 northbound and southbound ramps.

The existing Green Springs Avenue traffic signal controllers are of the Transit 1880E or similar type. There are no existing interconnect or communications linking the Green Springs Avenue signals which operate today as isolated intersections.

13. Parkway East - Nineteen signalized intersections that are mainly along this major arterial route and are supervised by the City's existing mainframe traffic control system will be brought under closed-loop control. New controller cabinets and Type 170 controllers will be installed at each intersection to replace a variety of older signal controllers. The new Parkway East closed-loop system will be controlled from a new central computer to be installed at the Birmingham traffic control room.

City of Birmingham Replace Existing CBD Mainframe Traffic Control System - Approximately 250 signalized intersections in the Birmingham CBD area are part of an existing mainframe computerized traffic control system. In this Transportation Improvement Plan (TIP) project, the existing 17 year old Concurrent Computer mainframe central computer will be replaced by Computran's latest PC-based system and control software. Additionally, traffic signal equipment will be updated at each intersection and new signal timing plans will be developed.

The existing system used Frequency Division Modulation (FDM) communications and is limited to the type of information that can be transmitted between the central computer and local intersection controllers. By changing to Time Division Multiplexing (TDM) communications, the new system will be more versatile and expand the amount of information that can be transmitted from the central computer to the local intersection controllers and vice versa.

As part of the mainframe replacement project, the City of Birmingham will carry out an extensive equipment update. New traffic signal cabinets and controllers will be installed at every intersection. The existing traffic signal controllers in the CBD area generally are of the solid state pre-NEMA variety dating back to the 1970's or earlier. All of the CBD controllers will be replaced by new Type 170 controllers.

The new equipment will allow for the implementation of more advanced, comprehensive

Shelby County TOPICS - Two Shelby County TOPICS projects are proposed in the Transportation Improvement Program for CMAQ funding:

1. Valleydale Road (C.R. 17) at Meadow Drive - Valleydale Road at Meadow Drive is an existing unsignalized intersection. As part of this TOPICS project, Shelby County will install traffic signalization and a southbound (Meadow Drive) left turn lane.
2. Valleydale Road (C.R. 17) at Indian Valley Road - Valleydale Road at Meadow Drive is an existing unsignalized intersection. As part of this TOPICS project, Shelby County will install traffic signalization and a southbound (Indian Valley Road) left turn lane.